

Harmful Algal Bloom FAQ for Veterinarians

What are harmful algal blooms?

A harmful algal bloom (HAB) occurs when there is rapid growth of naturally occurring cyanobacteria or phytoplankton which sometimes produce toxins that are detrimental to the health of people and animals. An algal bloom can look like foam, scum, mats, or paint on the surface of water and may be colors such as green, brown, blue and red. There may also be a foul odor associated with the algal bloom. **It is not possible to tell if a bloom is toxic just by looking at it.**

- In fresh water such as rivers, lakes and estuaries, cyanobacteria (sometimes known as blue-green algae) may be found which can produce toxins such as microcystin, cylindrospermopsin, and anatoxin.
- In salt water, two groups of marine phytoplankton—dinoflagellates and diatoms—may be found which can produce toxins. Dinoflagellates such as *Karenia brevis* (*K. brevis*) are associated with “red tides” in Florida and can produce brevetoxins. *K. brevis* is typically found along the Gulf Coast of Florida. Other toxins produced by dinoflagellates include saxitoxin and ciguatoxin. The diatom *Pseudo-nitzschia* can also produce a neurotoxin called domoic acid.
- Harmful algal blooms can also be found in brackish water (mixture of fresh and salt water).

Why are harmful algal blooms important to human and animal health?

Some HABs can produce toxins which may cause human and animal illness. Domestic animal and wildlife illness and death caused by HABs have been reported in Florida and throughout the United States. Because of their behavior, animals, particularly dogs, are especially susceptible to exposure to HAB toxins. Since dogs often live in proximity with their owners and share similar lifestyles, they can serve as sentinels for potential human health risks. Livestock are also known to be affected by HABs.

When are harmful algal blooms found in Florida?

Algal blooms can occur at any time but tend to be most common in Florida in late summer and early fall due to ideal growth conditions. The duration of an algal bloom can vary depending on physical and biological conditions that influence its growth and persistence, including sunlight, nutrients, and salinity, as well as the speed and direction of wind and water.

Where are animals exposed to harmful algal blooms in Florida?

In fresh water, algal blooms are more likely to form in warm, still waters that are rich in nutrients such as nitrogen and phosphorous. In salt water, certain environmental conditions such as the accumulation of nutrients near the surface of the ocean, increased sea surface temperature, wind and current conditions may result in increased brevetoxin exposure for humans and animals.

Cyanobacterial events have occurred in many freshwater bodies across the state. The Florida Department of Environmental Protection is responsible for coordinating sampling and testing of freshwater bodies. Some areas of interest identified by the Florida Department of Environmental Protection are Lake Okeechobee and the Caloosahatchee, St. Lucie, and St. Johns River regions.

For current freshwater algal and toxin testing results in Florida, please visit www.floridadep.gov/AlgalBloom.

Red tide events typically occur on the Gulf Coast of Florida but can be transported up the Atlantic coast as well. The Florida Fish and Wildlife Conservation Commission conducts sampling related to red tide. For current red tide status in Florida, please visit www.myfwc.com/research/redtide/statewide.

How are animals exposed?

Animals can be exposed by swimming in or drinking from water that contains HABs, by ingesting scum, foam, or other organic material that contains toxins, or by licking algae off their fur after swimming. Animals may also inhale aerosolized brevetoxin. Under certain environmental conditions, brevetoxin may also be able to travel inland from the coastal shoreline.

What are the expected clinical features of a harmful algal bloom-associated animal illness or death?*

*This information is not intended to be exhaustive and may be updated as more information becomes available. Some algal species may be able to produce more than one type of toxin.

Toxin	Likely associated water type	Time from exposure to onset of clinical signs	Possible clinical signs	Differential diagnoses	Possible laboratory and other findings
Hepatotoxin • Microcystin	Fresh water	Generally, minutes to 48 hours	<ul style="list-style-type: none"> • Depression • Anorexia • Vomiting and diarrhea • Petechiae and ecchymoses • Melena • Icterus • Ataxia • Collapse • Seizures 	<ul style="list-style-type: none"> • Toxicity caused by: <ul style="list-style-type: none"> ○ Rodenticides ○ Medication such as nonsteroidal anti-inflammatory drugs ○ Water intoxication ○ Sago palm ○ Xylitol ○ Other hepatotoxins • Leptospirosis 	<ul style="list-style-type: none"> • Elevated serum liver enzymes (e.g., ALT and ALP) • Thrombocytopenia • Prolonged prothrombin time and partial thromboplastin time • Hyperbilirubinemia • Hypoglycemia • Hypokalemia • Presence of toxin in clinical specimens • Diffuse, acute, severe hepatic, and renal tubular epithelial necrosis. • Hemorrhage in multiple organ systems
Hepatotoxin & nephrotoxin • Cylindrospermopsin	Fresh water	Generally, minutes to 48 hours	Like microcystin (above) and: <ul style="list-style-type: none"> • Polyuria/polydipsia • Anuria • Hematuria 	Like microcystin (above) and toxicity caused by: <ul style="list-style-type: none"> ○ Grapes • Leptospirosis 	Like microcystin (above) and: <ul style="list-style-type: none"> • Elevated BUN and creatinine • Proteinuria

Toxin		Likely associated water type	Time from exposure to onset of clinical signs	Possible clinical signs	Differential diagnoses	Possible laboratory and other findings
Neurotoxins	Anatoxin-a and guanitoxin (formerly known as anatoxin-a(s))	Fresh water	Generally, minutes to 48 hours (anatoxin often causes a very rapid onset of clinical signs)	<ul style="list-style-type: none"> • Muscle rigidity, tremors, seizures • Hypersalivation • Lacrimation • Urinary incontinence • Diarrhea • Cyanosis and respiratory failure • Sudden death 	<ul style="list-style-type: none"> • Toxicity caused by: <ul style="list-style-type: none"> ○ Organophosphate ○ Carbamate ○ Metaldehyde ○ Water intoxication 	<ul style="list-style-type: none"> • No specific clinical laboratory, post-mortem, or histopathological findings including normal serum sodium level. • Presence of toxin in clinical specimens
	Saxitoxin	Salt water				
	Brevetoxin	Salt water				

What confirmatory testing options are there?

These are a few laboratories* that currently offer algal toxin testing.

- California Animal Health and Food Safety Laboratory
- GreenWater Laboratories (Florida)
- Kansas State Veterinary Diagnostic Laboratory

Common specimens are gastrointestinal contents, urine, and water, but serum and tissue samples may also be appropriate in some instances; please check submission guidelines for each laboratory.

**No governmental approval, recommendation, accreditation, or endorsement of any kind is intended or implied by the appearance of any name in this listing. This list is not intended to be exhaustive.*

Post-mortem and histopathology may also be useful in making a diagnosis. Please contact your preferred reference laboratory.

What treatment options are there?

There is currently no specific antidote to any of the toxins produced by HABs. Treatment is symptomatic and supportive. The American Society for the Prevention of Cruelty to Animals (ASPCA) provides some information on treatment at www.aspcapro.org/resource/blue-green-algae-and-other-water-toxins-treatments. The ASPCA Animal Poison Control Center (888-426-4435) or Pet Poison Helpline (855-764-7661) can provide specific case consultation.



What preventive measures should owners take?

Owners should avoid letting pets enter water that is discolored, has a foul odor, has foam, scum, or algal mats, or has or is near dead fish or animals. **All blooms should be considered potentially toxic, and pets should not be allowed to enter water with an algal bloom as it is not possible to tell if an algal bloom is producing harmful toxins without testing. If in doubt, pets should stay out.**

- Pets should not be allowed to eat algae or dead animals on the shore.
- If pets have gone in water with an algal bloom, they should not be allowed to lick their fur and should be washed off immediately with tap water.
- Owners that live close to the beach should be aware of red tide events in their area. During red tide events, outdoor pets that live close to the beach should be brought inside during a bloom. Animals may also inhale aerosolized brevetoxin. Under certain environmental conditions, brevetoxin may also be able to travel inland from the coastal shoreline. Pets should not be allowed to eat or play with dead fish or foam that may accumulate on the beach during or after a red tide.
- Owners should follow any caution or alert signage that may be at the waterbody.

Why should I report harmful algal bloom-associated companion animal illness and death?

Reporting HAB-related illness will improve understanding of the incidence and impact of HABs and identify actions that will help prevent impacts on human, animal, and environmental health. The first indication of an HAB-related event in a local waterbody often originates from animal owners and veterinarians.

How can I report harmful algal bloom-associated companion animal illness and death?

Please contact the staff listed below to report any past, current, or future HAB-related companion animal illness/death (possible and confirmed). We would be interested in the case history, physical exam findings, differential diagnoses, laboratory results, and post-mortem findings.

- Dr. Sherri Kasper, DVM, MS, CertAqV
Harmful Algal Bloom Veterinary Epidemiologist
Sherri.Kasper@flhealth.gov
850-841-8465
- Dr. Danielle Stanek, DVM, DACVPM
State Public Health Veterinarian
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Fish kill or diseased fish can be reported to the Florida Fish and Wildlife Conservation Commission online at www.myfwc.com/redtide or by calling the Fish Kill Hotline at 800-636-0511.

Injured or dead wildlife can also be reported to the Florida Fish and Wildlife Conservation Commission by calling the Wildlife Alert Hotline at 888-404-3922.

Freshwater algal blooms can be reported to the Department of Environmental Protection online at www.reportalgalbloom.com or by calling 855-305-3903.



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